3. Environmental Analysis

This section of the EIR examines and describes the potential environmental impacts associated with the construction and operation of the proposed Tehachapi East Afterbay Project. The environmental impact analysis has been divided into subsections addressing individual environmental topics. Each of the subsections is divided into three major parts: (1) Regulatory Setting; (2) Environmental Setting; and (3) Impacts and Mitigation Measures.

The "Regulatory Setting" sections for each environmental topic include brief descriptions of various existing public policies, regulations, programs, and standards relevant to the environmental topic. Often, these existing policies and regulations serve to reduce or avoid potential environmental impacts.

The "Environmental Setting" sections for each environmental topic describe existing conditions in the project area that may be subject to change as a result of the implementation of the proposed project.

The "Impacts and Mitigation Measures" sections for each environmental topic describe the anticipated environmental impacts that could result from the construction, operation, and routine maintenance of the proposed project. The potential environmental impacts are evaluated based on significance criteria presented at the beginning of the impact analysis for each environmental topic. In determining the significance of impacts, the ability of existing regulations and other public agency requirements to reduce potential impacts is taken into consideration. If an adverse impact is potentially significant despite existing regulations and requirements, mitigation measures are proposed to reduce or avoid the impact, where feasible. Mitigation measures are only required for significant adverse impacts.

A significant impact is defined in the California Environmental Quality Act (CEQA) as "a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project." The State CEQA Guidelines and various responsible agencies provide guidance for determining the significance of impacts; however, the determination of impact significance for each project is based on the independent judgment of the Lead Agency. Similarly, the establishment of any criteria used to evaluate the significance of impacts is the responsibility of the Lead Agency. Criteria used to determine the significance of the proposed project's impacts are presented in the sections addressing individual environmental issue areas (Sections 3.1 and 3.2).

In the environmental impact analysis, impacts are classified as either "less than significant," "significant but mitigable," or "significant and unavoidable." These classifications are based on the significance criteria presented for each environmental topic and take into consideration mitigation measures proposed to reduce the significance of impacts. Those environmental topics found to have no impacts are not classified. The following classification system is used to describe the potential effects of the proposed project:

- **Class I: Significant Unavoidable Impact.** Class I impacts are significant adverse effects that cannot be mitigated below a level of significance through the application of feasible mitigation measures. Class I impacts are significant and unavoidable.
- **Class II: Significant but Mitigable Impact.** A Class II impact is a significant adverse effect that can be reduced to a less-than-significant level through the implementation of mitigation measures presented in the EIR.

- **Class III: Less-than-Significant Impact.** A Class III impact is a minor change or effect on the environment that does not meet or exceed the criteria established to gauge significance. Less-than-significant impacts do not require mitigation.
- **Class IV: Beneficial Impact.** Class IV impacts represent beneficial effects that would result from project implementation.

The determination of whether or not a potential impact is significant is the key consideration in the environmental impact analysis. It is the intent of CEQA to focus on the significant adverse effects of a project, and it is the potential for a project to result in such impacts that triggers the requirement to prepare an EIR. For impacts that are determined not to be significant, the EIR need only provide sufficient information to indicate why the impacts are not significant. For significant impacts, adequate information and analysis must be provided to characterize each impact and provide the public and decision makers with an understanding of the nature and severity of the impact. The level of detail and analysis needed to adequately characterize significant impacts varies depending on the nature of the impact. Certain types of impacts require quantitative analysis in order to determine impact significance, characterize adverse effects, and formulate appropriate mitigation measures. Other types of impacts require more qualitative analysis with the determination of impact significance based on the independent judgment of the Lead Agency.

An evaluation of the impacts of project alternatives is presented in Section 4. A discussion of cumulative impacts for each environmental topic is provided in Section 5.3.

3.1 Air Quality

3.1.1 Introduction

This section presents information on ambient air quality conditions in the vicinity of the project site and identifies potential impacts to air quality as a result of the construction and operation of the proposed project. Sections 3.1.2 and 3.1.3 describe the existing setting as it relates to applicable regulations and air quality, respectively. Section 3.1.4 describes impacts and mitigation measures, including the methodology and criteria for determining significance. Mitigation measures are proposed for any impact determined to be significant.

3.1.2 Regulatory Setting

3.1.2.1 Ambient Air Quality Standards

Regulation of air pollution is achieved through a combination of ambient air quality standards and emission limits for individual sources and categories of sources of air pollutants. The federal Clean Air Act requires the U.S. Environmental Protection Agency (USEPA) to identify National Ambient Air Quality Standards (NAAQS or federal ambient air quality standards) to protect public health and welfare. The NAAQS are established for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter, and lead. These pollutants are called "criteria" air pollutants because the intent of the standards is to meet specific public health and welfare criteria. California has adopted more stringent ambient air quality standards (CAAQS or State ambient air quality standards) for most of the criteria air pollutants. The applicable national and state ambient air quality standards (AAQS) and a brief discussion of the related heath effects and principal sources for each pollutant are presented in Table 3-1. As indicated in this table, the averaging times for the various air quality standards (the duration over which they are measured) range from 1-hour to annual. The standards are read as a mass fraction, in parts per million (ppm), or as a concentration, in milligrams or micrograms of pollutant per cubic meter of air (mg/m^3 or $\mu g/m^3$).

As required by the federal Clean Air Act, the USEPA classifies air basins or portions thereof, as either "attainment" or "nonattainment" for each criteria air pollutant, based on whether or not the national standards have been achieved. The California Clean Air Act also requires designation of areas as "attainment" or "nonattainment" for the State standards, rather than the national standards. Thus, areas in California have two sets of attainment/nonattainment designations: one set with respect to the national standards and one set with respect to the State standards.

The federal Clean Air Act also requires nonattainment areas to prepare air quality plans that demonstrate the strategies for achieving attainment. Adopted air quality plans developed to meet federal requirements are referred to as State Implementation Plans (SIPs). The California Clean Air Act also requires plans for nonattainment areas with respect to the State standards. Thus, just as areas in California have two sets of designations, many also have two sets of air quality plans: one to meet federal requirements relative to the national standards and one to meet State requirements relative to the State standards.

Table 3-1. Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Standard	California Standard	Pollutant Health and Atmospheric Effects	Major Pollutant Sources
Ozone (O_3)	8-Hour	0.08 ppm (157 µg/m^3)	—	High concentrations can directly affect lungs, causing irritation. Long-term exposure may cause damage to lung tissue.	Formed when reactive organic gases (ROG) and nitrogen oxides (NO_X) react in the presence of sunlight. Major sources include on-road motor vehicles, solvent evaporation, and commercial/ industrial mobile equipment.
	1-Hour	0.12 ppm (235 µg/m^3)	0.09 ppm (180 µg/m^3)		
Carbon Monoxide (CO)	8-Hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	Classified as a chemical asphyxiant, carbon monoxide interferes with the transfer of fresh oxygen to the blood and deprives sensitive tissues of oxygen.	Internal combustion engines, primarily gasoline-powered motor vehicles.
	1-Hour	35 ppm (40 mg/m^3)	20 ppm (23 mg/m^3)		
Nitrogen Dioxide (NO_2)	Annual Avg.	0.053 ppm (100 µg/m^3)	—	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown.	Motor vehicles, petroleum refining operations, industrial sources, aircraft, ships, and railroads.
	1-Hour	—	0.25 ppm (470 µg/m^3)		
Sulfur Dioxide (SO_2)	Annual Avg.	0.030 ppm (80 µg/m^3)	—	Irritates upper respiratory tract; injurious to lung tissue. Can yellow the leaves of plants, destructive to marble, iron, and steel. Limits visibility and reduces sunlight.	Fuel combustion, chemical plants, sulfur recovery plants, and metal processing.
	24-Hour	0.14 ppm (365 µg/m^3)	0.04 ppm (105 µg/m^3)		
	3-Hour	0.5 ppm (1300 µg/m^3)	—		
	1-Hour	—	0.25 ppm (655 µg/m^3)		
Respirable Particulate Matter (PM_{10})	Annual Arithmetic Mean	50 µg/m^3	20 µg/m^3	May irritate eyes and respiratory tract, decreases in lung capacity, cancer and increased mortality. Produces haze and limits visibility.	Dust and fume-producing industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays).
	24-Hour	150 µg/m^3	50 µg/m^3		
Fine Particulate Matter ($PM_{2.5}$)	Annual Arithmetic Mean	15 µg/m^3	12 µg/m^3	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and results in surface soiling.	Fuel combustion in motor vehicles, equipment, and industrial sources; residential and agricultural burning; Also, formed from photochemical reactions of other pollutants, including NO_X, sulfur oxides, and organics.
	24-Hour	65 µg/m^3	—		
Lead	Calendar Quarter	1.5 µg/m^3	—	Disturbs gastrointestinal system, and causes anemia, kidney disease, and neuromuscular and neurological dysfunction.	Present source: lead smelters, battery manufacturing & recycling facilities. Past source: combustion of leaded gasoline.
	30-Day Average	—	1.5 µg/m^3		

Source: CARB 2004a and SCAQMD 1993.

3.1.2.2 Regulatory Agencies

The USEPA is responsible for implementing the many programs established under the federal Clean Air Act, such as establishing and reviewing the national ambient air quality standards and judging the adequacy of SIPs, but has delegated the authority to implement many of the federal programs to the states while retaining an oversight role. The California Air Resources Board (CARB), the State's air quality management agency, is responsible for establishing and reviewing the State ambient air quality standards, compiling the California State Implementation Plan and securing approval of that plan from the USEPA, and identifying toxic air contaminants. The CARB also regulates some sectors of mobile sources in California, including large construction equipment, and oversees the activities of air quality management districts, which are organized at the county or regional level. The local air quality management districts are primarily responsible for regulating stationary emissions sources at industrial and commercial facilities within their geographic area and for preparing the air quality plans that are required under the federal Clean Air Act and California Clean Air Act.

3.1.2.3 Air Quality Plans, Policies, and Regulations

The USEPA, CARB, and the local air district classify an area as attainment, unclassified, or nonattainment, depending on whether or not the monitored ambient air quality data show compliance, insufficient data available, or non-compliance with the ambient air quality standards, respectively. The proposed project site for the Tehachapi East Afterbay would be located within the Mojave Desert Air Basin (MDAB), which is under the jurisdiction of the Kern County Air Pollution Control District (KCAPCD). However, the proposed project site would be located approximately a third of a mile from Los Angeles County, which is under the jurisdiction of the Antelope Valley Air Quality Management District (AVAQMD). Table 3-2 summarizes federal and state attainment status of criteria pollutants for eastern Kern County and Antelope Valley.

Table 3-2. Attainment Status for Eastern Kern County and Antelope Valley

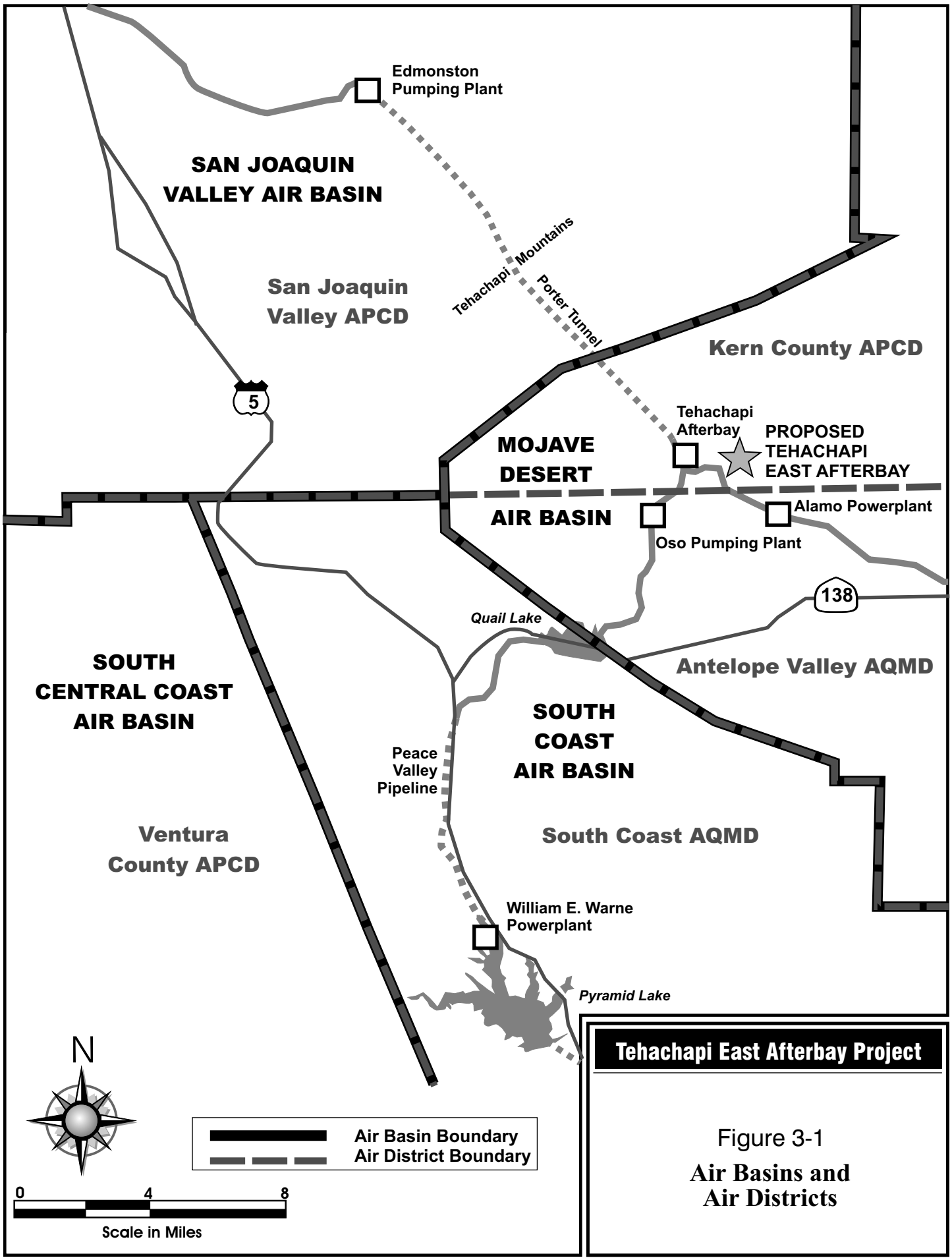
Pollutant	Attainment Status Eastern Kern County		Attainment Status Antelope Valley	
	Federal	State	Federal	State
Ozone – One hour	Serious Nonattainment [a]	Moderate Nonattainment	Severe -17 Nonattainment [d]	Extreme Nonattainment [b]
Ozone – Eight hour	Nonattainment	---	Nonattainment	---
CO	Unclassified/Attainment [c]	Unclassified	Unclassified/Attainment [c]	Attainment
NO_2	Unclassified/Attainment [c]	Attainment	Unclassified/Attainment [c]	Attainment
SO_2	Attainment	Attainment	Attainment	Attainment
PM_{10}	Unclassified	Nonattainment	Unclassified	Nonattainment
$PM_{2.5}$	Unclassified [f]	Unclassified [e]	Unclassified [f]	Unclassified [e]
Lead	No Designation	Attainment	No Designation	Attainment

Source: CARB 2004a.

a. The Kern County Air Pollution Control District is in the process of filing an "Ozone Attainment Demonstration, Maintenance Plan, and Redesignation Request" with CARB and USEPA. Eastern Kern County has attained the 1-hour ozone NAAQS of 0.12 ppm. Attainment is achieved when each air monitoring station experiences no more than an average of one exceedance day per year for three consecutive years.
b. The Antelope Valley Air Quality Management District is classified as extreme nonattainment due to historical South Coast Air Basin designation.
c. Unclassified/Attainment – The attainment status for the subject pollutant is classified as either attainment or unclassified.
d. "Severe–17 Nonattainment" requires the district to attain the ozone standard within 17 years (1990-2007).
e. Proposed State $PM_{2.5}$ attainment status from 2003 Staff Report Attachment B - Proposed Amendments to the Area Designations available at: http://www.arb.ca.gov/desig/desig03/desig03.htm.
f. Proposed Federal $PM_{2.5}$ attainment status recommended by the California Air Resources Board on February 11, 2004. The USEPA plans to finalize $PM_{2.5}$ designations by December 15, 2004 (http://www.arb.ca.gov/desig/pm25desig/pm25desig.htm).

As mentioned above, the proposed Tehachapi East Afterbay project site would be located within the Mojave Desert Air Basin, which is under the jurisdiction of the KCAPCD, however, several other air basins and air districts are located adjacent to the proposed project site as shown in Figure 3-1. Areas immediately south of the Los Angeles County line fall under the jurisdiction of the AVAQMD (MDAB). Further to the south and southwest is the South Coast Air Basin (SCAB) under the jurisdiction of the South Coast Air Quality Management District (SCAQMD). To the west and northwest over the Tehachapi Mountains is the San Joaquin Valley Air Basin (SJVAB) under the jurisdiction of the San Joaquin Valley Air Pollution Control District.

KCAPCD was designated by the USEPA as a separate ozone planning area in October 2001 (USEPA 2001). In May 2003, KCAPCD's Board of Directors approved an "Ozone Attainment Demonstration, Maintenance Plan, and Redesignation Request," which shows that KCAPCD has attained the one-hour average NAAQS for ozone (KCDB 2003). After approval, KCAPCD's Ozone Attainment Demonstration was submitted to CARB for approval and submittal to USEPA as a SIP amendment. The Ozone Attainment Demonstration document is



Tehachapi East Afterbay Project

Figure 3-1

Air Basins and Air Districts

not an attainment plan, as it does not describe additional emission control measures to be developed and implemented for the purpose of attaining air quality standards.

The Antelope Valley AQMD became the newest of 35 local air districts throughout California in July of 1997. The AVAQMD Management Plan is contained in the South Coast Air Basin 1994 Air Quality Management Plan Appendix I-A (SCAQMD 1994). The plan generally relies on aggressive control of the SCAB emissions to improve air quality in the Antelope Valley. Targeted pollutants include NO_x and VOC with an ozone attainment date of 2007.

3.1.2.4 Rules and Regulations

The responsibility for developing regional air quality plans within the project area of the MDAB is the KCAPCD. The KCAPCD exercises permit authority through its *Rules and Regulations*. Under KCAPCD's *Rules and Regulations*, new stationary sources must secure a permit to construct (Rule 201) and a permit to operate (Rule 201.1) and must comply with New Source Review (NSR) requirements (Rule 210.1). NSR sets forth pre-construction review requirements for new and modified stationary sources to ensure that the operation of such sources will not interfere with progress in attainment of State and national ambient air quality standards, and to ensure that such sources are constructed with Best Available Control Technology (BACT). The specific air quality goal of NSR is to provide for no significant net increase in emissions from new and modified stationary sources for all non-attainment pollutants and their precursors. These rules would apply to the concrete batch plant and associated screening plant, if the construction contractor requires this equipment, and to the emergency generator, if the manufacturer's maximum continuous rating is greater than 50 brake horsepower (bhp).

Prevention of Significant Deterioration (PSD) requirements (Rule 210.4) provide for pre-construction review of major sources and major modifications. A major source is defined (Rule 201.1) as any stationary source having the potential to emit 100 tons/year (tpy) of any regulated air pollutant, 50 tpy of volatile organic compounds (VOC) or oxides of nitrogen (NO_x) if the district is classified as serious nonattainment for ozone, 10 tpy of one hazardous air pollutant (HAP) or 25 tpy of two or more HAPs, or any lesser quantity threshold promulgated by the USEPA. For new or modified stationary sources within an ozone nonattainment area, the offset trigger thresholds are as follows: 15 tpy for PM_{10}, 27 tpy for SO_x (as SO_2), 25 tpy for VOC, and 25 tpy for NO_x (as NO_2). The proposed Tehachapi East Afterbay is not considered a major source, as it would not emit any regulated air pollutant from stationary sources in quantities greater than the thresholds provided above during construction or operation; therefore, PSD would not apply.

District *Rules and Regulations* that may apply to the proposed project include:

- Rule 401 Visible Emissions. Prohibits visible air emissions as dark or darker in shade than No. 1 on the Ringelmann chart (20 percent opacity) for more than 3 minutes in any 1-hour.
- Rule 404.1 Particulate Matter Concentration – Desert Basin. Limits particulate emissions from the operation of any single source to less than 0.1 grains per cubic foot of gas at standard conditions (gr/scf).
- Rule 419 Nuisance. Prohibits any emissions "which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public or which endanger the comfort, repose, health or safety of any such person or public or which cause or have a natural tendency to cause injury or damage to business or property."

3.1.3 Environmental Setting

3.1.3.1 Meteorological Conditions

The climate of eastern Kern County is characterized by hot, dry summers and mild to cold winters with small amounts of precipitation that occur primarily during the late winter and spring months. Summer typically has clear skies, high temperatures, and low humidity. A monthly climate summary for Lancaster, California, (approximately 32 miles southeast of the proposed project) was selected to characterize the climate of the study area. As described in Table 3-3, average summer (June-August) high and low temperatures in the study area are 95°F and 60°F, respectively. Average winter (December-February) high and low temperatures in the study area are 61°F and 29°F. The average annual precipitation is 7.4 inches with over 75 percent occurring between December and March. Little precipitation occurs during summer because a high-pressure cell blocks migrating storm systems over the eastern Pacific.

Table 3-3. Monthly Average Temperatures and Precipitation

Month	Temperature, °F		Precipitation, inches
	Maximum	Minimum	
January	57	31	1.60
February	61	35	1.62
March	65	39	1.44
April	71	45	0.32
May	79	53	0.12
June	89	60	0.05
July	95	66	0.10
August	95	64	0.14
September	88	57	0.20
October	78	46	0.30
November	65	35	0.50
December	57	29	1.01

Source: The Weather Channel 2003.
Note: Averaged over a minimum period of 30 years.

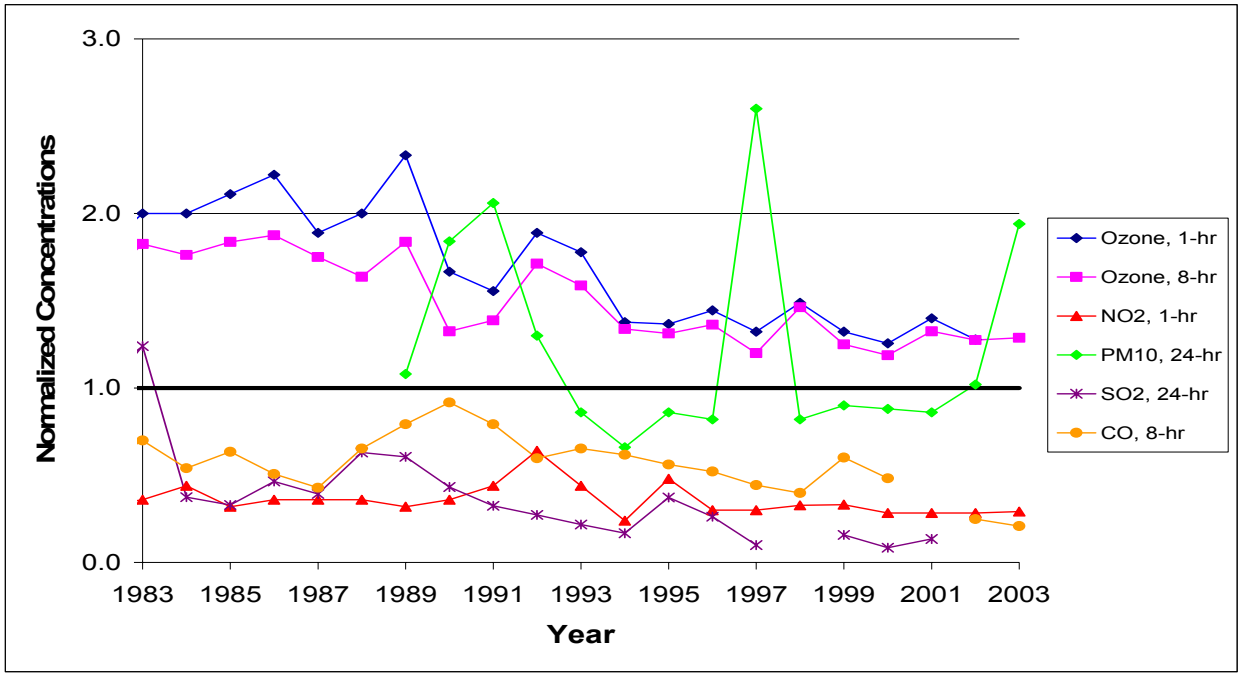
The project would be located in the western portion of Antelope Valley at the foothills of the Tehachapi Mountains. The San Emigdio Mountains are located to the west and the western San Gabriel Mountains are located to the south. These mountain ranges essentially block the region from the relatively cool marine air from the Pacific Ocean. Prevailing winds in the MDAB are out of the west and southwest (AVAQMD 2002).

3.1.3.2 Existing Air Quality

The project site would be in Kern County, near the border of Los Angeles County, in the western portion of the Antelope Valley. The Mojave Poole Street monitoring station is located approximately 35 miles northeast of the proposed project site. This station monitors ambient concentrations of ozone, NO_2, PM_{10}, and $PM_{2.5}$. Ozone, CO, NO_2, PM_{10}, and $PM_{2.5}$ are recorded at the Lancaster West Pondera Street monitoring station, located approximately 33 miles southeast of the project site. Ozone, CO, NO_2, PM_{10}, and $PM_{2.5}$ concentrations are currently recorded at the Lancaster Division Street monitoring station. The Mojave Poole Street monitoring station would be the most representative available monitoring station to the proposed project site, although emissions measured at this location would provide a conservative estimate of the local emissions since the City of Mojave is much more populated than the proposed project site. The nearest monitoring station for SO_2 is in the City of Bakersfield, about 50 miles from the proposed project site, which would again provide a conservative estimate of the local emissions.

Figure 3-2 summarizes the historical air quality data for the project area collected at the nearest representative air quality monitoring stations. Additional monitoring stations in Mojave, Lancaster, and Bakersfield were included to cover the 20-year period from 1983 to 2003. For ozone and NO_2, the following monitoring stations were used: Lancaster (1983-1989), Lancaster West Pondera Street (1990-1993), and Mojave Poole Street (1994-2003). For CO, the following monitoring stations were used: Lancaster (1983-1989), Lancaster Pondera Street (1990-2000), and Mojave Division Street (2002-2003). For PM_{10}, the following monitoring stations were used: Mojave Airport (1989-1993) and Mojave Poole Street (1994-2003). For SO_2, the following monitoring stations were used: Bakersfield Chester Street (1983-1993) and Bakersfield California Avenue (1994-1997 and 1999-2001). In Figure 3-2, the short term normalized concentrations are provided from 1983 to 2003. Normalized concentrations represent the ratio of the highest measured concentrations in a given year to the most-stringent applicable national or state ambient air quality standard. Therefore, normalized concentrations lower than one indicates that the measured concentrations were lower than the most-stringent ambient air quality standard.

Figure 3-2. Normalized Maximum Short-term Historical Air Pollutant Concentrations



Source: CARB 2002, CARB 2004a.
Note(s):
(1) A Normalized Concentration is the ratio of the highest measured concentration to the applicable most stringent air quality standard. For example, in 1999 the highest 1-hour average ozone concentration measured at Mojave Poole Street was 0.119 ppm. Since the most stringent ambient air quality standard is the state standard of 0.09 ppm, the 1999 normalized concentration is 0.119/0.09 = 1.32.
(2) The second highest maximums for PM_{10} in 1990 and 2002 are used since the highest maximums, which are 462 and 208 $\mu g/m^3$, respectively, likely occurred as a result of wind-related events.

As shown in Figure 3-2, the project area is above the state 1-hour ozone standard and the state 24-hour PM_{10} standard. However, there has been an overall gradual downward trend for the maximum ozone concentrations.

Ozone

In the presence of ultraviolet radiation, both NO_x and VOCs go through a number of complex chemical reactions to form ozone. Table 3-4 summarizes the best representative ambient ozone data for the project area collected over the past ten years from various monitoring stations. The table includes the maximum hourly concentration and the number of days above the National and State standards. As indicated in this table, ozone formation is generally higher in spring and summer and lower in the winter. The Antelope Valley is classified as a severe nonattainment area for ozone for the 1-hour NAAQS, due to the historical SCAB designation, and an extreme nonattainment area for the 1-hour CAAQS. Eastern Kern County is classified as a serious nonattainment area for ozone for the 1-hour NAAQS; however, as shown in Table 3-4, Eastern Kern County has attained the 1-hour ozone NAAQS of 0.12 ppm. The KCAPCD is in the process of filing an "Ozone Attainment Demonstration, Maintenance Plan, and Redesignation Request" with CARB and USEPA. Attainment is achieved when each air monitoring station averages no more than one day per year for three consecutive years over the standard concentrations. Eastern Kern County is classified as a moderate nonattainment area for the 1-hour ozone CAAQS. Both Antelope Valley and Eastern Kern County are classified as nonattainment areas for ozone for the 8-hour ozone NAAQS (USEPA 2003b).

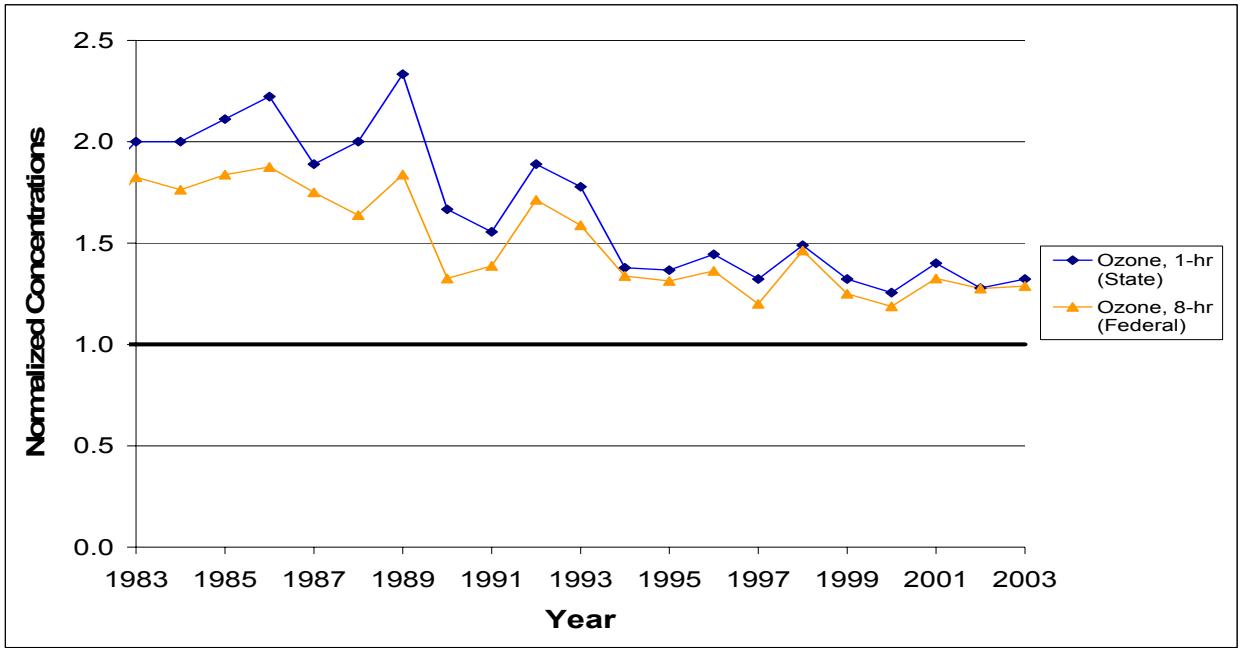
Table 3-4. Ozone Air Quality Summary 1994-2003

Year	Days Above NAAQS 1-Hr	Days Above CAAQS 1-Hr	Month of Max. 1-Hr Avg.	Max. 1-Hr Avg. (ppm)	Days Above NAAQS 8-Hr	Month of Max. 8-Hr Avg.	Max. 8-Hr Avg. (ppm)
Lancaster West Pondera Street							
1994	10	62	AUG	0.143	33	JUL	0.112
1995	5	61	JUN	0.141	35	JUL	0.112
1996	1	40	JUL	0.131	18	JUN	0.104
1997	0	14	JUN	0.123	7	JUN	0.101
1998	8	24	JUL	0.164	18	JUL	0.118
1999	0	1	JUN	0.097	0	JUN	0.083
2000	2	35	JUL	0.141	28	JUL	0.117
2001	3	37	JUL	0.146	24	AUG	0.102
Lancaster – 43301 Division Street							
2002	5	46	JUL	0.157	38	AUG	0.107
2003	4	50	JUL	0.156	33	JUL	0.120
Mojave – 923 Poole Street							
1994	0	43	JUL	0.124	46	JUN	0.107
1995	0	33	AUG	0.123	30	AUG	0.105
1996	2	46	AUG	0.130	42	MAY	0.109
1997	0	22	DEC	0.119	19	JUN	0.096
1998	2	43	JUL	0.134	40	JUL	0.117
1999	0	39	SEP	0.119	34	JUL	0.100
2000	0	25	JUL	0.113	15	JUL	0.095
2001	1	33	AUG	0.126	33	MAY	0.106
2002	0	18	JUL	0.115	26	JUL	0.102
2003	0	31	JUL	0.119	27	JUN	0.103

Source: CARB 2002, CARB 2004a.
California Ambient Air Quality Standard (CAAQS): 1-hr, 0.09 ppm
National Ambient Air Quality Standard (NAAQS): 1-hr, 0.12 ppm; 8-hr, 0.08 ppm

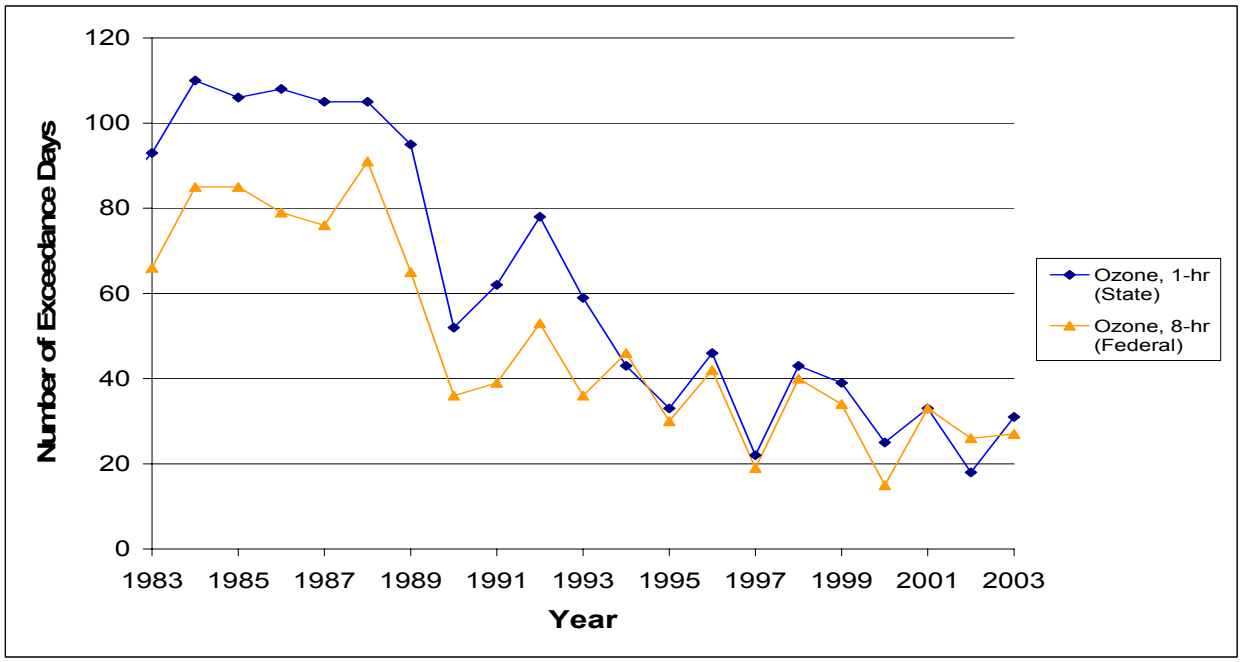
The year 1983 to 2003 trends for the maximum 1-hour and 8-hour ozone concentrations, referenced to the most stringent standard, and the number of days exceeding the California 1-hour standard and the Federal 8-hour standard for the Lancaster (1983-1989), Lancaster W Pondera Street (1990-1993), and Mojave Poole Street (1994-2003) monitoring stations are shown in Figures 3-3 and 3-4, respectively.

**Figure 3-3. Normalized Ozone Air Quality Maximum Concentrations (1983-2003)
Lancaster (1983-1989), Lancaster W Pondera St. (1990-1993), and Mojave Poole St. (1994-2003)**



Source: CARB 2002, CARB 2004a.
Note: A Normalized Concentration is the ratio of the highest measured concentration to the applicable most stringent air quality standard. The standard used for 1-hour ozone is the state standard of 0.09 ppm, and for 8-hr ozone is the national standard of 0.08 ppm.

**Figure 3-4. Ozone 1-Hr and 8-Hr – Number of Days Exceeding the CAAQS (1983-2003)
Lancaster (1983-1989), Lancaster W Pondera St. (1990-1993), and Mojave Poole St. (1994-2003)**



Source: CARB 2002, CARB 2004a.

As shown in Figures 3-3 and 3-4, long-term trends in reduced emissions of ozone precursors have led to reduced ozone formation in the project area, although the area continues to be above the state 1-hour and federal 8-hour ozone standards.

Carbon Monoxide (CO)

CO is generally found in high concentrations only near a significant source of emissions (i.e., freeway, busy intersection, etc.). The highest concentrations of CO occur when low wind speeds and a stable atmosphere trap the pollution emitted at or near ground level in what is known as the stable boundary layer. These conditions occur frequently in the wintertime late in the afternoon, persist during the night and may extend one or two hours after sunrise. Since mobile sources (motor vehicles) are the main cause of CO, ambient concentrations of CO are highly dependent on motor vehicle activity. In fact, the peak CO concentrations occur during the rush hour traffic in the morning and afternoon. Carbon monoxide concentrations in Los Angeles County and the rest of the State have declined significantly due to two Statewide programs: (1) the 1992 wintertime oxygenated gasoline program, and (2) Phases I and II of the reformulated gasoline program. Additionally, overall vehicle fleet turnover from higher-emitting older engines to lower-emitting new engines is a significant factor in the declining CO levels.

Table 3-5 summarizes the best representative ambient carbon monoxide data for the project area collected over the past ten years from various monitoring stations. The table includes the maximum 1-hour and 8-hour concentrations. The proposed project site would be expected to have lower CO levels than those presented, as the area experiences less vehicle traffic, which is the major contributor to CO emissions. As indicated in the table, there have been no exceedances of California Ambient Air Quality Standards or National Ambient Air Quality Standards since at least 1994 for the 1-hour and the 8-hour CO standards. The Antelope Valley and Eastern Kern County are either unclassified or in attainment for carbon monoxide.

Table 3-5. Carbon Monoxide Air Quality Summary 1994-2003

Year	Maximum 1-Hr Avg. (ppm)	Month of Max. 8-Hr Avg.	Maximum 8-Hr Avg. (ppm)
	Lancaster West Pondera Street		
1994	8.0	JAN	5.56
1995	9.1	NOV	5.05
1996	7.5	DEC	4.69
1997	6.8	DEC	3.99
1998	5.9	DEC	3.59
1999	5.4	JAN	5.41
2000	7.2	DEC	4.34
2001	6.0	---	---
	Lancaster – 43301 Division Street		
2002	---	SEP	2.24
2003	---	DEC	1.88

Source: CARB 2002, CARB 2004a.
California Ambient Air Quality Standard (CAAQS): 1-hr, 20; 8-hr, 9.0 ppm
National Ambient Air Quality Standard (NAAQS): 1-hr, 35 ppm; 8-hr, 9 ppm

Nitrogen Dioxide (NO_2)

The majority of the NO_x emitted from combustion sources is in the form of NO, while the balance is mainly NO_2. NO is oxidized by O_2 (oxygen) in the atmosphere to NO_2 but some level of photochemical activity is needed for this conversion. This is why the highest concentrations of NO_2 generally occur during the fall and not in the winter, when atmospheric conditions favor the trapping of ground level releases of NO but lack significant radiation intensity (less sunlight) to oxidize NO to NO_2. In the summer, the conversion rates of NO to NO_2 are high, but the relatively high temperatures and windy conditions (atmospheric unstable conditions) disperse pollutants, preventing the accumulation of NO_2 to levels approaching the 1-hour ambient air quality

standard. NO is also oxidized by O_3 to form NO_2. The formation of NO_2 in the summer with the help of the ozone occurs according to the following reaction:

$$NO + O_3 \rightarrow NO_2 + O_2$$

In urban areas, ozone concentration level is typically high. That level will drop substantially at night as the above reaction takes place between ozone and NO. This reaction explains why, in urban areas, ozone concentrations at ground level drop, while aloft and in downwind rural areas (without sources of fresh NO_x emissions) ozone concentrations can remain relatively high.

Table 3-6 summarizes the best representative ambient nitrogen dioxide data for the project area collected over the past ten years from various monitoring stations. The table includes the maximum 1-hour and annual concentrations. As indicated in the table, there have been no exceedances of California Ambient Air Quality Standards or National Ambient Air Quality Standards since at least 1994 for the 1-hour and the annual NO_2 standards. The Antelope Valley and Eastern Kern County are either unclassified or in attainment for nitrogen dioxide.

Table 3-6. Nitrogen Dioxide Air Quality Summary 1994-2003

Year	Month of Max. 1-Hr Avg.	Maximum 1-Hr Avg. (ppm)	Maximum Annual Avg. (ppm)
		Lancaster West Pondera Street	
1994	SEP	0.097	0.0179
1995	APR	0.140	0.0194
1996	DEC	0.080	0.0153
1997	OCT	0.071	0.0138
1998	NOV	0.077	0.0158
1999	NOV	0.083	0.0175
2000	NOV	0.065	0.0156
		Lancaster – 43301 Division Street	
2002	JUN	0.101	0.016
2003	MAY	0.067	0.015
		Mojave – 923 Poole Street	
1994	SEP	0.060	0.00780
1995	JAN	0.120	0.00835
1996	AUG	0.075	0.00881
1997	DEC	0.075	0.01011
1998	AUG	0.082	0.01114
1999	SEP	0.083	0.00977
2000	FEB	0.071	0.01044
2001	SEP	0.071	0.00967
2002	NOV	0.071	0.009
2003	FEB	0.073	0.009

Source: CARB 2002, CARB 2004a.
California Ambient Air Quality Standard (CAAQS): 1-hr, 0.25 ppm
National Ambient Air Quality Standard (NAAQS): Annual, 0.053 ppm

Inhalable Particulate Matter (PM_{10})

PM_{10} can be emitted directly or it can be formed many miles downwind from emission sources when various precursor pollutants interact in the atmosphere. Gaseous emissions of pollutants like NO_x, SO_x, VOC, and ammonia, given the right meteorological conditions, can form particulate matter in the form of nitrates (NO_3), sulfates (SO_4), and organic particles. These pollutants are known as secondary particulates, because they are not directly emitted, but are formed through complex chemical reactions in the atmosphere.

Table 3-7 summarizes the ambient particulate matter data collected from various monitoring stations nearest the project area. The table includes the maximum 24-hour and annual arithmetic average concentrations. The most representative data for the project area would be from Mojave, as this area is less populated compared to Lancaster and would therefore provide a better approximation of the particulate matter concentrations in the proposed project area.

Table 3-7. Particulate Matter Air Quality Summary 1994-2003

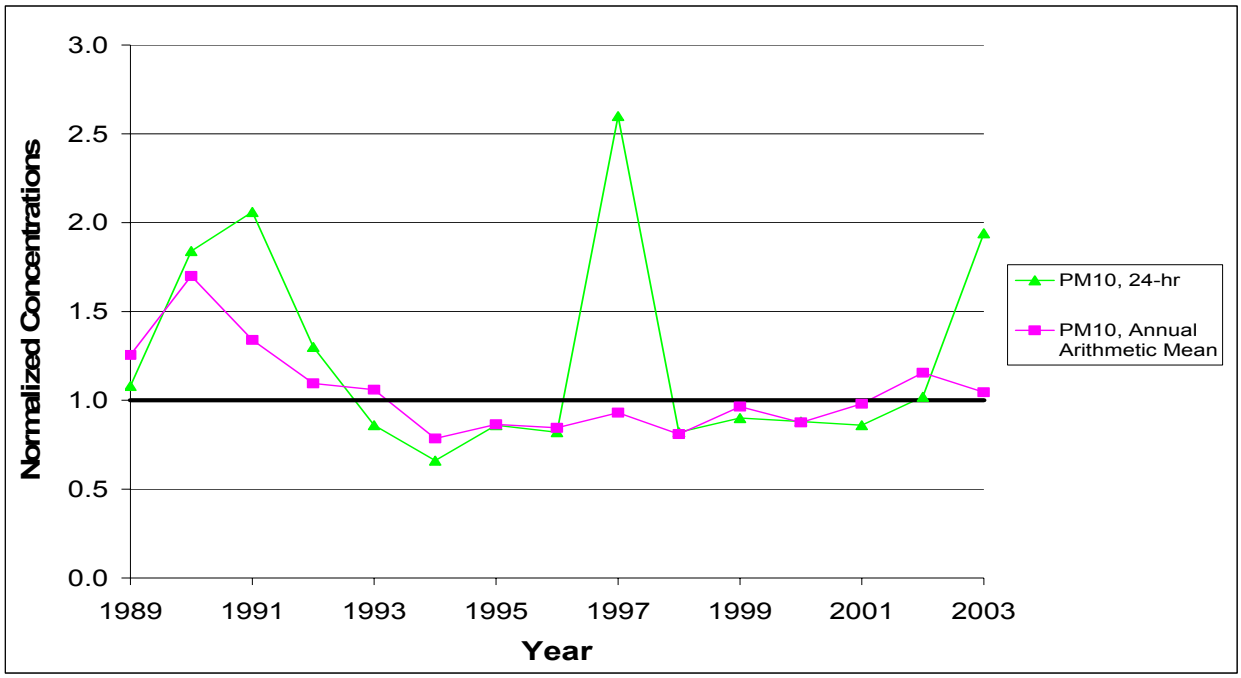
Year	Days * Above Daily NAAQS	Days * Above Daily CAAQS	Month of Max. Daily Avg.	Max. Daily Avg. ($\mu g/m^3$)	Annual Arithmetic Mean ($\mu g/m^3$)
			Lancaster West Pondera Street		
1994	0	18	JAN	97	29.3
1995	0	18	NOV	61	25.5
1996	0	12	SEP	67	29.0
1997	0	9	FEB	54	29.2
1998	0	7	DEC	80	23.6
1999	0	12	DEC	85	28.7
			Lancaster – 43301 Division Street		
2002	0	---	DEC	73	29.7
2003	0	---	OCT	57	24.6
			Mojave – 923 Poole Street		
1994	0	0	SEP	33	15.7
1995	0	0	OCT	43	17.3
1996	0	0	AUG	41	16.9
1997	0	6	AUG	130	18.6
1998	0	0	APR	41	16.2
1999	0	0	SEP	45	19.3
2000	0	0	OCT	44	17.5
2001	0	0	JUN	43	19.6
2002	7	7	OCT	51	23.1
2003	0	12	FEB	97	20.9

Source: CARB 2002, CARB 2004a.
California Ambient Air Quality Standard (CAAQS): 24-hr, 50 $\mu g/m^3$; annual arithmetic, 20 $\mu g/m^3$
National Ambient Air Quality Standard (NAAQS): 24-hr, 150 $\mu g/m^3$; annual arithmetic, 50 $\mu g/m^3$
* Days above the state and national standard (calculated): Because PM_{10} is monitored approximately once every six days, the potential number of exceedance days is calculated by multiplying the actual number of days of exceedance by six.
Note: The second highest maximum for PM_{10} in 2002 at the Mojave Poole Street monitoring station is reported, as the highest maximum was found to occur as a result of a wind-related event.

As shown in Table 3-7, the project area (Mojave data) has recently (2002-2003) experienced exceedances of the state and federal 24-hour PM_{10} standards and the state annual arithmetic mean PM_{10} standards. Prior to 2002, the 24-hour PM_{10} levels were below the federal standard since 1991. It should be noted that this area experiences desert dust storms that can cause high PM impacts, but are not considered actual violations. Currently, the Antelope Valley and Eastern Kern County are unclassified for the federal PM_{10} standards and are in nonattainment of the state PM_{10} standards.

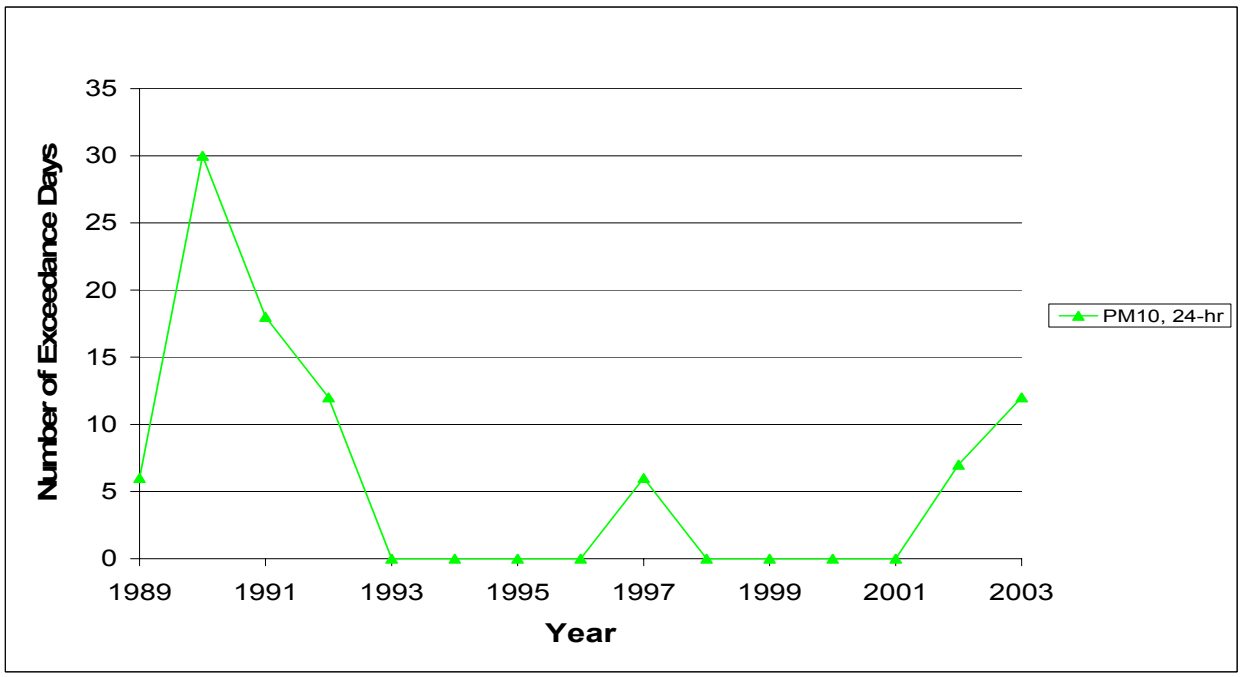
The year 1989 to 2003 trends for the maximum 24-hour PM_{10} and annual arithmetic mean PM_{10}, referenced to the most stringent standard, and the number of days exceeding the California 24-hour PM_{10} standard for the Mojave Airport (1989-1993) and Mojave – 923 Poole Street (1994-2003) monitoring stations are shown in Figures 3-5 and 3-6, respectively.

**Figure 3-5. Normalized PM_{10} Air Quality Maximum Concentrations (1989-2003)
Mojave Airport (1989-1993) and Poole Street (1994-2003)**



Source: CARB 2002, CARB 2004a.
Note(s):
(1) A Normalized Concentration is the ratio of the highest measured concentration to the applicable most stringent air quality standard. The standard used for 24-hour PM_{10} is the state standard of 50 $\mu g/m^3$, and for annual arithmetic mean PM_{10} is the state standard of 20 $\mu g/m^3$.
(2) The second highest maximums for PM_{10} in 1990 and 2002 are used since the highest maximums, which are 462 and 208 $\mu g/m^3$, respectively, likely occurred as a result of wind-related events.

**Figure 3-6. PM_{10} 24-Hour – Number of Days Exceeding the CAAQS (1989-2003)
Mojave Airport (1989-1993) and Poole Street (1994-2003)**



Source: CARB 2002, CARB 2004a.

As the two figures show, there is an overall gradual downward trend for PM_{10} concentrations and number of exceedances of the California 24-Hour Standard since 1990, with the exception of 1997, 2002, and 2003; however, there has been little or no progress since 1993. Additionally, meeting the revised PM_{10} annual arithmetic mean state standard of 20 $\mu g/m^3$ will pose an even greater challenge than meeting the former annual geometric mean state standard of 30 $\mu g/m^3$.

Fine Particulate Matter ($PM_{2.5}$)

While the $PM_{2.5}$ NAAQS were issued in 1997, their implementation has been delayed. States were given until February 15, 2004, to recommend to EPA which areas should be designated as attainment and nonattainment. The California Air Resources Board submitted the data and recommendations to USEPA on February 11, 2004 (www.arb.ca.gov/desig/pm25desig/coverltr_feb11_04.pdf).

Those areas recommended to be designated as nonattainment areas include SJVAB, SCAB, San Diego County, and Calexico (www.arb.ca.gov/desig/pm25desig/encl1_feb11_04.pdf). All other areas are recommended to be designated attainment/unclassified. These recommendations were based on data from the years 2000-2002. The USEPA will provide final designations by December 15, 2004, based on data from 2001-2003 (www.arb.ca.gov/desig/pm25desig/pm25desig.htm). States have three years from the time of final designation (December 2007) to provide $PM_{2.5}$ attainment plans in a state implementation plan (SIP).

The Office of Administrative Law formally approved CARB's recommended $PM_{2.5}$ ambient air quality standard on June 5, 2003. CARB adopted the proposed $PM_{2.5}$ CAAQS attainment status at the Board hearing held January 22, 2004; however, the regulations have not taken affect due to the current status of the State Administration (CARB 2004b). The proposed attainment status for the Kern County portion of the MDAB is unclassified (CARB 2004c). Unlike the NAAQS, the CAAQS do not have attainment planning requirements, and CARB does not anticipate that this standard will cause any immediate changes in the California New Source Review requirements.

Table 3-8 summarizes the ambient fine particulate matter data collected over the past four years from various monitoring stations nearest the project area.

Table 3-8. Fine Particulate Matter Air Quality Summary 1999-2002

Year	Month of Max. Daily Avg.	Max. Daily Avg. ($\mu g/m^3$)	98th Percentile of Max. Daily Avg. ($\mu g/m^3$)	Days * Above 98th Percentile Daily NAAQS	3-Yr. Avg. 98th Percentile of Max. Daily Avg. ($\mu g/m^3$)	National Annual Avg. ($\mu g/m^3$)	3-Yr. Avg. of National Annual Avg. ($\mu g/m^3$)
Lancaster West Pondera Street							
1999	JUL	47.6	23.5	0	---	11.2	---
2000	DEC	36.0	21.0	0	---	10.5	---
Lancaster – 43301 Division Street							
2002	OCT	24.0	20.0	0	---	10.4	---
Mojave – 923 Poole Street							
2001	MAY	15.3	13.9	0	---	6.1	---

Source: CARB 2002, CARB 2004a.
National Ambient Air Quality Standard: 3-Year Average - 98th Percentile of 24-Hr Avg. Conc., 65 μg/m3;
3-Year Average of Annual Arithmetic Mean (National Annual Average), 15 μg/m3; 3-Year Average of Annual Arithmetic Mean (State Annual Average), 12 μg/m3
* Days above the state standard (calculated): Because PM2.5 is monitored approximately once every six days, the potential number of exceedance days is calculated by multiplying the actual number of days of exceedance by six.

As shown in Table 3-8, the 98th percentile 24-hour average $PM_{2.5}$ concentration levels are below the proposed NAAQS of 65 $\mu g/m^3$ within the project area.

Sulfur Dioxide (SO_2)

Sulfur dioxide is typically emitted as a result of the combustion of a fuel containing sulfur. Fuels such as natural gas contain very little sulfur and consequently have very low SO_2 emissions when combusted. By contrast, fuels high in sulfur content such as coal or heavy fuel oils can emit very large amounts of SO_2 when combusted.

Sources of SO_2 emissions come from every economic sector and include a wide variety of fuels, gaseous, liquid and solid. Antelope Valley and Eastern Kern County are designated attainment for all the SO_2 state and federal ambient air quality standards. Table 3-9 summarizes the best representative ambient sulfur dioxide data for the project area collected over the past ten years.

As shown in Table 3-9 and Figure 3-2, concentrations of SO_2 are far below the state and federal SO_2 ambient air quality standards.

Table 3-9. Sulfur Dioxide Air Quality Summary 1994-2003

Year	Maximum 1-Hr Avg. (ppm)	Month of Max. 24-Hr Avg.	Maximum 24-Hr Avg. (ppm)	Annual Average (ppm)
		Bakersfield – 5558 California Street		
1994	0.020	DEC	0.0067	0.0027
1995	0.026	MAR	0.0149	0.0028
1996	0.059	APR	0.0105	0.0022
1997	0.011	JAN	0.0040	0.0020
1998	---	---	---	---
1999	0.011	NOV	0.0063	0.0032
2000	0.019	NOV	0.0034	0.0025
2001	0.030	MAR	0.0054	0.0017
2002	---	---	---	---
2003	---	---	---	---

Source: CARB 2002.
California Ambient Air Quality Standard (CAAQS): 1-hr, 0.25 ppm; 24-hr, 0.04ppm
National Ambient Air Quality Standard (NAAQS): 3-hr, 0.5 ppm; 24-hr, 0.14 ppm; annual average, 0.03 ppm

Summary

As discussed above, the proposed project area is in nonattainment for the state and federal 1-hour ozone standards and the state 24-hour PM_{10} standard, and either unclassified or in attainment for carbon monoxide, nitrogen dioxide, and sulfur dioxide. Long-term trends in reduced emissions of ozone precursors, specifically NO_x and VOCs, have led to reduced ozone formation in the project area; however the area continues to be above the state 1-hour and federal 8-hour ozone standards. In addition, while there is an overall gradual downward trend for PM_{10} concentrations, there has been little or no progress since 1993. As such, any increase in emissions of ozone precursors and particulate matter would cause or contribute to existing air quality violations, causing a significant air quality impact.

3.1.3.3 Sensitive Receptors

Some land uses are considered more sensitive to air pollution than others due to the types of population groups or activities involved. Sensitive population groups include children, the elderly, the acutely ill and the chronically ill, especially those with cardio-respiratory diseases.

Residential areas are also considered to be sensitive to air pollution because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposure to any pollutants

present. Recreational land uses are considered moderately sensitive to air pollution. Although exposure periods are generally short, exercise places a high demand on respiratory functions, which can be impaired by air pollution. In addition, noticeable air pollution can detract from the enjoyment of recreation. Industrial and commercial areas are considered the least sensitive to air pollution. Exposure periods are relatively short and intermittent, as the majority of the workers tend to stay indoors most of the time. In addition, the working population is generally the healthiest segment of the public.

A land use survey was conducted to identify sensitive receptors (e.g., local residences, schools, hospitals, churches, recreational facilities) in the general vicinity of the proposed project. No sensitive receptors were identified within the immediate project vicinity. The proposed project site would be located in a generally undeveloped area, where the closest rural residence is located approximately 4,000 feet to the southwest on Pumping Plant Road.

3.1.4 Impacts and Mitigation Measures

3.1.4.1 Methodology

For the proposed project, construction is expected to occur from February 2005 to June 2006 (17-months). To provide both a conservative estimate of air quality emissions associated with the proposed project and to provide for some flexibility, it was assumed that the construction contractor would import concrete to the proposed project site, rather than having an on-site concrete batch plant and associated screening plant. Given that the source of concrete has yet to be determined, this conservative approach allows the CDWR to finalize these options at a later date.

Air emissions for the proposed project were calculated using a standard calculation methodology accepted by such agencies as the SCAQMD and incorporating project environmental commitments, such as the use of Tier 1 diesel engines for construction equipment. For on-road vehicles, emission factors for the year 2005 from CARB's EMFAC 2002 on-road motor vehicle emissions model (CARB 2004a) were used. For off-road vehicles, Tier 1 emission factors from the USEPA's non-road engine modeling guidelines (USEPA 2002) were used. Fugitive dust emissions were calculated using the USEPA's AP-42 emission factors (USEPA 2003a) and various SCAQMD CEQA Handbook guideline parameters (e.g., gravel road silt loading content equal to 4%) (SCAQMD 1993), which are not available from KCAPCD or AVAQMD. The calculated emissions for the project were then compared to the significance criteria (defined below).

3.1.4.2 Criteria for Determining Significance

CEQA allows for the significance criteria established by the applicable air quality management or air pollution control district to be used to assess impacts of a project on air quality. The AVAQMD and the KCAPCD have established thresholds of significance for construction activities and for project operations as shown below in Table 3-10. As a conservative approach, considering the relative proximity of the various air districts to the project site, the most stringent of these standards would apply to the proposed project.

Table 3-10. Air Quality Thresholds

Criteria Pollutant	Antelope Valley		Eastern Kern County	
	tons/year	lbs/day	tons/year	lbs/day [c]
Carbon Monoxide (CO)	100	548	100 [b]	548
Oxides of Nitrogen (NO_x)	25	137	25 [a]	137
Particulate Matter (PM_{10})	15	82	15 [a]	82
Oxides of Sulfur (SO_x)	25	137	27 [a]	148
Volatile Organic Compounds (VOC)	25	137	25 [a]	137

Source: KCAPCD 1999, Article V(E), and AVAQMD 2002.
a. KCAPCD Rule 210.1 – NSR as referenced in KCAPCD 1999 Article V(E).
b. KCAPCD Rule 201.3 – Federally Enforceable Limits on Potential to Emit
c. Daily threshold derived from yearly thresholds assuming 365 days/year.
d. KCAPCD limits the emissions of NOx or VOCs from motor vehicle trips (indirect sources only) to less than 137 lbs/day.

Note that ozone and $PM_{2.5}$ are not included in Table 3-10. Ozone is not directly emitted from stationary or mobile sources; rather it is formed as the result of chemical reactions in the atmosphere between directly emitted air pollutants, specifically oxides of nitrogen (NO_x) and hydrocarbons (VOCs). Therefore, it cannot be directly regulated. $PM_{2.5}$ is not included as it is currently in the beginning stages of becoming regulated, and as such, thresholds have not yet been developed.

While the proposed project falls within the jurisdiction of the KCAPCD and borders the AVAQMD, it should also be noted that some employee trips and a certain limited number of haul truck trips would travel through the SCAB. The SCAQMD recommends that lead agencies use specified regional emission levels as thresholds for significance (SCAQMD 1993). These recommended thresholds are different than those presented in Table 3-10 (CO = 550 lbs/day, NO_x = 100 lbs/day, PM_{10} = 150 lbs/day, SO_x = 150 lbs/day, and VOC = 75 lbs/day).

For this analysis, the proposed project may also result in significant impacts if:

- Criterion A1: The project would be inconsistent with the applicable Air Quality Management Plan.
- Criterion A2: The proposed project would generate emissions of air pollutants that would exceed the AVAQMD or KCAPCD emission thresholds (Table 3-10).
- Criterion A3: The project would contribute air emissions to the region, which would add to the cumulative baseline.
- Criterion A4: The project would expose sensitive receptors to substantial pollutant concentrations.
- Criterion A5: The project would expose a substantial number of people to objectionable odors.

3.1.4.3 Project Impacts

Air Quality Management Plan (Criterion A1)

Kern County Air Pollution Control District's Ozone Attainment Demonstration document is not an attainment plan, as it does not describe additional emission control measures to be developed and implemented for the purpose of attaining air quality standards. The Antelope Valley Air Quality Management District has a Management Plan as part of the South Coast Air Basin 1994 Air Quality Management Plan (Appendix I-A). This plan generally relies on aggressive control of the SCAB emissions to improve air quality in the Antelope Valley.

Air quality in the Antelope Valley is affected by the transport of ozone and its precursor emissions from the SCAB. With this in mind, NO_x and VOC control measures are recommended in the Air Quality Management

Plan for Antelope Valley to meet attainment of the federal ozone standard in the Antelope Valley by November 15, 2007. Of the control measures presented, the only measure applicable to the proposed project is FIP-11, which proposes a strategy to regulate emissions from non-road internal combustion engines greater than or equal to 50 horsepower (hp). The proposal calls for the USEPA to adopt emission standards in two phases and a fleet average fee program (SCAQMD 1994, Appendix IV-B). The Phase I emission standards (Tier 1) apply to new engines manufactured after January 1996. These standards were to be phased in by engine size over four years beginning in 1996 on a national basis. The more stringent Phase 2 emission standards (Tier 2) apply to non-road heavy-duty engines sold in the SCAB, and apply to 1999 and later model year engines over their full useful lives.

The USEPA adopted the first federal standards (Tier 1) for new nonroad (or off-road) diesel engines in 1994 (Dieselnet 2003). On August 27, 1998, the USEPA signed the final rule introducing Tier 1 standards for off-road diesel engines and increasingly more stringent Tier 2 and Tier 3 standards for all equipment, with phase-in schedules from 2000 to 2008. On April 15, 2003, the USEPA signed proposed Tier 4 standards to reduce PM and NO_x emissions by over 90 percent. The Tier 1 standards were phased-in from 1996 to 2000. The more stringent Tier 2 standards take effect from 2001 to 2006. The Tier 3 standards will phase-in from 2006 to 2008, and the Tier 4 standards will phase-in from 2008 to 2014. To meet the requirements of the Antelope Valley Air Quality Management Plan, the CDWR would use construction and maintenance diesel equipment that meets Tier 1 emission requirements or better, to the extent feasible. Therefore, the proposed project would be consistent with the Air Quality Management Plan for Antelope Valley. Less-than-significant impacts (**Class III**) would occur as a result of the proposed project. No mitigation measures would be required.

Emission Thresholds (Criterion A2)

Construction

Construction of the Tehachapi East Afterbay would result in short-term impacts to ambient air quality in the study area during construction, which is tentatively scheduled for February 2005 to June 2006. Temporary construction emissions would result from on-site activities, such as surface clearing, excavation, stockpiling of soils, and compaction, and from off-site construction emissions from construction related haul trips and construction worker commuting patterns. Pollutant emissions would vary from day to day depending on the level of activity, the specific operations, and the prevailing weather.

Construction equipment would include machinery such as scrapers, water trucks, compactors, dump trucks, graders, bulldozers, loaders, excavators, asphalt paving equipment, cranes, and concrete pump trucks (CDWR 2003a). Table 3-11 presents the construction schedule based on the anticipated construction activities and the proposed equipment usage during each half-month of construction.

During construction of the Tehachapi East Afterbay, it is estimated that a maximum of 100 and an average of 65 construction workers (CDWR 2004i) would drive between the project site and either Bakersfield (25 percent), Los Angeles (25 percent), Lancaster (25 percent), or Frazier Park (25 percent) (CDWR 2004h), for an average commute trip of 70 miles each way.

Additional off-site trips would include haul truck trips to deliver construction equipment and materials to the project site. Materials to be delivered include: concrete, steel, aggregate, hydraulic asphalt concrete (HAC),

Table 3-11. Proposed Project Equipment Schedule

Activity / Month	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10	10.5	11	11.5	12	12.5	13	13.5	14	14.5	15	15.5	16	16.5	17
Clear and Grub																																		
Reservoir Excavation and Spoil																																		
Reservoir Lining																																		
Drainage Culvert																																		
Out/Inlet Channel Excavation																																		
Out/Inlet Channel Embankment																																		
Out/Inlet Channel Lining																																		
Inlet Weir Chute and Basin																																		
Bypass Structure																																		
Bypass Chute & Basin																																		
Cofferdam																																		
Penstock Headworks Channel Reconstruction																																		
Demolition of Old Canal																																		
New Canal Lining																																		
Install Gate (Sitework)																																		
Sitework																																		
Equipment																																		
Scrapers			8	8	8	8	8	8	8	8	8	8	8	8	7	6	6	6	6					3	3	3	3	2						
Bulldozers	1	1	5	5	5	5	4	4	4	4	4	4	4	4	4	4	4	4	4							2	2	2						
Excavators			2	2	2	2	2	2				2	2	3	3	3	3	3	3	4	2	4	4	2	2	2	2	2	2	2	2	2	1	1
Loaders	1	1	3	3	3	3	3	3	2	2	2	3	3	4	4	4	4	4	4	5	3	4	5	3	3	3	3	3	3	3	3	3	3	3
Motor Grader	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	3	4	4	4	4	4	3	3	3	3	3	3	3	3	3	3	3
Cranes					1	1	1	1	1	1	1	1	2	2	2	3	3	3	3	3	4	4	3	3	3	2	2	2	2	2	2	2	1	1
Compactors							1	1	2	2	2	3	3	3	3	3	3	3	3	2														
Truck- Water	1	2	2	3	3	3	3	3	3	3	3	3	4	4	4	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2
Asphalt Paver														1	1	1	1	1	1	1	1	1	1	1								0.5		
Asphalt Compactor														1	1	1	1	1	1	1	1	1	1	1								0.5		
Concrete Pumper Truck					1	1	1	1							2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1 Ton Pickup			1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3/4 Ton Pickup	1	1	1	1	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2	2	1	1	1	1	1	1	2	2	2	2
Welder/Generator	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1

Source: CDWR 2004f. TEA Equipment Schedule with modification for the AQ analysis.

geotextile fabric, drain rock, rip rap, stone slope protection, pre-fabricated structures (e.g., slide gates/operators, trash racks, stop logs, guard rails, precast concrete drop inlet, valves, piping, control building/ancillary equipment, etc.), and other miscellaneous supplies (e.g., metal, fuel, seeding, fencing, etc.). These materials would be trucked in from as near as Lancaster (60 miles roundtrip) or as far as the Port of Los Angeles (200 miles roundtrip) (CDWR 2003e). It should be noted that the shortest roundtrip for the emission calculations was assumed to be 40 miles.

A considerable number of the off-site truck trips are associated with importing concrete, which is assumed as the worst-case scenario for air quality emissions. However, the final source of concrete has not been determined and may include using an on-site mobile batch plant. An on-site concrete batch plant with a screening plant could be utilized to mix trucked cement with sand and aggregate from the soil excavated at the project site and/or borrow site, thereby reducing the number of off-site truck trips required. While off-site emissions associated with trucking would be reduced, on-site emissions associated with the operation of the batch plant and screening plant would increase. The overall emission reductions associated with operating an on-site mobile batch plant are not expected to considerably reduce the worst-case daily or annual emissions, nor would using an on-site batch plant affect the significance determination.

It is assumed that the worst-case day would occur in Month 7. Table 3-12 presents the estimated total maximum (worst-case) daily construction emissions for the proposed project. Maximum daily construction emission calculations and assumptions are presented in Appendix B.

Table 3-12. Maximum Daily Emissions for the Proposed Project During Construction (Month 7), lbs/day

	CO	NO_x	PM_{10}	SO_x	VOC
On-Site					
Construction Equipment	357	998	32.9	1.19	50.3
Fugitive Dust / Paving	---	---	4,387	---	---
Off-site					
Worker Travel	128	13.8	0.67	0.08	13.7
Truck Deliveries	50.1	67.2	1.19	0.59	7.05
Road Dust	---	---	54.7	---	---
Total Emissions	535	1,079	4,477	1.9	71.1
Emissions Thresholds	548	137	82	137	137

Note(s):
(1) Maximum daily emissions assume excavation activities occur during one daily shift of 10 hours per day. Up to two 12-hour shifts may be utilized during outages, however the activities occurring during outage periods are not expected to cause greater emissions than those estimated for Month 7.
(2) The majority of the air pollutant emissions result from the on-site earthmoving activities. Employee and haul trucks trips traveling through the SCAB would represent only a small portion of the total off-site emissions, as the majority of construction materials would be obtained locally (Lancaster, CA). Therefore, the SCAQMD recommended construction emission significance thresholds would not be exceeded.

Table 3-13 presents the estimated worst-case construction emissions for the 17-month construction period. Project construction emission calculations and assumptions details are presented in Appendix B.

Table 3-13. Maximum Emissions for the Proposed Project During Construction, tons

	CO	NO_x	PM_{10}	SO_x	VOC
On-Site					
Construction Equipment	38.5	104	3.48	0.14	5.55
Fugitive Dust / Paving	---	---	468	---	0.10
Off-site					
Worker Travel	18.3	1.97	0.10	0.01	1.96
Truck Deliveries	4.75	4.44	0.11	0.06	0.67
Road Dust	---	---	10.1	---	---
Total Emissions	62	110	482	0.21	8.3

As shown in Table 3-12, daily construction emissions would be significant for NO_x and PM_{10}, but would not be significant for CO, SO_x, and VOC. Additionally, the total project NO_x and PM_{10} emissions provided in Table 3-13 averaged over the 17-month construction period would exceed the annual emissions thresholds provided in Table 3-10 (NO_x = 78 tons/year >25 tons/year and PM_{10}= 340 tons/year > 15 tons/year).

The proposed project would result in the generation of air pollutants in an area classified as serious nonattainment for the federal ozone standard, and nonattainment for the state ozone and PM_{10} standards. This would be a significant impact. It should be noted that off-site emissions would occur in multiple air basins and air districts; however on-site daily emissions alone would be greater than the significance thresholds for both NO_x (998 > 137 lbs/day) and PM_{10} (4,420 > 82 lbs/day). Additionally, the off-road equipment tailpipe emission estimates do not assume mitigation beyond the use of Tier 1 equipment.

Implementation of the following mitigation measures, as well as the CDWR's environmental commitments (see Section 2.5), would reduce impacts associated with construction of the Tehachapi East Afterbay:

AQ-1 CDWR shall develop a Fugitive Dust Emission Control Plan (FDECP). Measures to be incorporated into the plan shall include, but are not limited to, the following:

- Water active construction sites at least three times per day, except during periods of rainfall or those areas that have been temporarily covered, have vegetative ground cover, or have had chemical stabilization applied according to the FDECP.
- Enclose, cover, water twice daily, or apply non-toxic soil binders according to manufacturer's specifications to exposed piles (i.e., gravel, dirt and sand) with a five percent or greater silt content.
- Increase the frequency of watering, or implement other additional fugitive dust mitigation measures, to all disturbed fugitive dust emission sources when wind speeds (as instantaneous wind gusts) exceed 25 miles per hour (mph). Operations causing significant fugitive dust (i.e. grading and other earthmoving operations) shall be suspended when winds carry visible dust plumes beyond the property line despite implementation of all feasible dust control measures.
- Apply water three times daily, except during periods of rainfall, to all unpaved road surfaces.
- Topsoil stockpiled for more than two days shall be covered, kept moist and/or treated with soil binders to prevent dust generation. Although keeping the stockpile moist can prevent dust generation, it may not provide protection from water erosion and therefore additional protection measures may be necessary (see BIO-2).
- Topsoil stockpiled for more than one year shall be planted and watered to sustain biological components as well as prevent dust emissions (see BIO-2).
- Maintain on-site vehicle travel to the lowest practical speeds to reduce fugitive dust emissions.

- Sweep streets at the end of the day if visible soil material is carried onto adjacent public paved roads (Whenever possible, use water sweepers with reclaimed water). The use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit the visible dust emissions. Use of blower devices is expressly forbidden.
- All vehicle tires shall be inspected, are to be free of dirt, and washed as necessary prior to entering paved roadways.
- Install wheel washers or wash the wheels of trucks and other heavy equipment where vehicles exit the site.
- Gravel ramps of at least 20 feet in length must be provided at the tire washing/cleaning station.
- Cover all trucks hauling soil and other loose material, or require at least two feet of freeboard.
- Establish a vegetative ground cover on unpaved areas within 21 days after active construction operations have ceased. (Ground cover must be of sufficient density to expose less than 50 percent of unstabilized ground within 90 days of planting, and at all times thereafter).
- When backfilling during earthmoving operations, dedicate a water truck or large hose to backfilling equipment and operations and apply water as needed; or, cover or enclose stationary backfill material; if needed, mix backfill soil with water prior to moving. Empty loader buckets slowly and minimize their drop heights. Immediately after backfilling, apply soil stabilization compounds to form a crust.
- When clearing and grubbing, pre-wet surface soils in the operation area; stabilize surface soil with dust palliative unless construction activities are to immediately take place; and use water or dust palliative to form a crust on soil immediately following clearing/grubbing.
- During cut and fill activities, pre-water with sprinklers or wobblers to allow time for penetration; pre-water with water trucks or water pulls to allow time for penetration.
- Post a publicly visible sign with the telephone number to contact regarding dust complaints. The construction contractor shall respond and take corrective action with 24 hours.

AQ-2 The construction contractor shall ensure that all mechanical equipment associated with project construction is properly tuned and maintained in accordance with the manufacturer's specifications.

AQ-3 Use CARB certified ultra low sulfur diesel (ULSD) fuel containing 15 ppm sulfur or less.

AQ-4 Restrict diesel engine idle time, to the extent practical, to no more than 10 minutes.

AQ-5 Schedule all material deliveries to the construction site outside of peak traffic hours, and minimize other truck trips during peak traffic hours.

AQ-6 The engine size of construction equipment shall be the minimum practical size.

AQ-7 Apply non-toxic soil binders to on-site access roadways, staging areas, and parking area(s) throughout construction, as necessary to reduce fugitive dust emissions.

These mitigation measures would reduce the impacts due to construction of the Tehachapi East Afterbay; however, impacts from NO_x, and PM_{10} emissions would still be significant. Therefore, the proposed project would result in a significant unavoidable impact (**Class I**) to air quality (NO_x, and PM_{10}) during construction. A Statement of Overriding Considerations will be required to proceed with the proposed project.

Operation

Once operational, the proposed project would involve a new emergency generator, which would be permitted through the KCAPCD, if greater than 50 brake horsepower. Normal operations of the emergency generator would be limited to reliability testing. Emissions associated with the operation of the emergency generator

would be less than the daily significance thresholds shown in Table 3-10. There would also be occasional vehicle trips that would result in negligible emissions of ozone precursors and PM_{10} over the long term. These activities would not generate pollutants in excess of the AVAQMD or KCAPCD emission thresholds. Therefore, air quality impacts from operations would be less than significant (**Class III**).

Civil and preventative maintenance activities would include: grading access roads; repairing asphalt sections, as needed; cleaning and maintaining all drainage ditches; implementing erosion control practices in the immediate area, as needed; applying herbicides and pesticides, as needed, to adjacent land and to the water in the proposed reservoir; removing aquatic growth and wind blown debris; performing coating work on gates and other structures; and maintaining signs, fencing gates, protective devices, etc. A preventative maintenance schedule (annual, semi-annual) would be set up for the mechanical and electrical equipment. The reservoir liner would also be inspected and cleaned of silt approximately every five to ten years. Silt would be removed with small rubber-tired loaders and dump trucks and deposited on top of the spoil pile or supplemental spoil pile at designated areas. The spoil embankment would be revegetated to prevent erosion.

Heavy equipment and fugitive dust emissions from operations and maintenance activities would produce temporarily increased levels of air pollutants; however these activities, except the use of herbicides and pesticides, would be exempt. Pesticide and herbicide use would be controlled through mitigation measure BIO-1 (see Section 3.2.4.2). Therefore, no impacts would occur as a result of operation and maintenance of the Tehachapi East Afterbay. Mitigation measures AQ-1 through AQ-6, above, would minimize the generation of dust and exhaust emissions associated with civil and preventative maintenance activities.

Cumulative (Criterion A3)

Construction of the Tehachapi East Afterbay would occur from February 2005 to June 2006. Other construction projects identified within the MDAB include the Centennial Project, the National Cement Company Fuel Augmentation Project, and the Racetrack and Caretaker Structure (see Section 5.3 – Cumulative Impacts). Emissions from these projects would only have the potential to cause cumulatively significant impacts if they were constructed concurrently with the proposed project. Construction of the Centennial Project is expected to occur after the completion of the East Afterbay. Additionally, the National Cement Company Fuel Augmentation Project involves little construction and would likely be complete by the end of 2004. Operation of this project would result in negligible additional, perhaps even decreased, emissions. The Racetrack and Caretaker Structure would be constructed within the MDAB; however, it is unknown when construction would occur. Therefore, air quality impacts within the MDAB from construction and operations associated with these projects would not be cumulatively considerable. However, because the proposed project would contribute significant air emissions during construction that would add to the cumulative baseline, a significant contribution to cumulative impacts would occur (**Class I**). Mitigation measures AQ-1 through AQ-7, above, would minimize the proposed project's contribution to cumulative air quality impacts to the extent feasible. However, the implementation of these mitigation measures would not reduce the proposed project's contribution to cumulative impacts to a level of less than significant.

Sensitive Receptors (Criterion A4)

Construction of the proposed project would result in exposing sensitive receptors to substantial pollutant concentrations. It is anticipated that during construction the concentration of PM_{10} would exceed the 24-hour

standard of 50 $\mu g/m^3$ at nearby residential locations. The conditions necessary to cause exceedances of the PM_{10} 24-hour standard would be expected to occur infrequently, as the predominate wind direction (from the west and southwest) at the proposed project site is not in the direction of the closest residence. Those residences located in the direction of the predominate winds, while situated further (approximately three miles) from the proposed project site, also may experience exceedances of the PM_{10} 24-hour standard. Therefore, construction of the Tehachapi East Afterbay would result in significant air quality impacts to sensitive receptors. Implementation of mitigation measures AQ-1 through AQ-7 would reduce the impacts to sensitive receptors during construction of the Tehachapi East Afterbay; however, impacts would still be considered significant. Therefore, the proposed project would result in a significant unavoidable impact (**Class I**) to sensitive receptors during construction. A Statement of Overriding Considerations will be required to proceed with the proposed project.

Odors (Criterion A5)

Diesel emissions from construction equipment may create objectionable odors. These odors would be temporary and would not affect a substantial number of people. Operation of the proposed project would not result in objectionable odors, as regular maintenance of the Aqueduct includes treating the water several times a year with copper sulfate to control algae growth. Therefore, construction and operation of the proposed project would not create objectionable odors. Impacts due to odors would be less than significant (**Class III**).

3.1.4.4 Impact and Mitigation Summary

Table 3-14 presents a summary of the impacts and mitigation measures for air quality.

Table 3-14. Impact and Mitigation Summary – Air Quality

Proposed Project Impact	Class	Mitigation Measures
The proposed project would be inconsistent with an Air Quality Management Plan.	III	None required.
Construction emissions would exceed the emission thresholds, and would therefore cause a short-term impact to local air quality conditions.	I	AQ-1 through AQ-7
Operational activities would result in the generation of air pollutants in an area classified as nonattainment for ozone and PM_{10} and would therefore cause or contribute to existing air quality violations.	III	None required.
Construction and/or operation of the proposed project would have the potential to contribute to cumulatively significant impacts.	I	AQ-1 through AQ-7
Construction of the proposed project would expose sensitive receptors to substantial pollutant concentrations.	I	AQ-1 through AQ-7
Construction and/or operation of the proposed project would expose a substantial number of people to objectionable odors.	III	None required.